GLOBE at Night

Welcome to GLOBE at Night!

Family Activity Packet

This packet includes:
Family Observation Guide
Magnitude Charts
Observation Data Sheet

March 22-29, 2006

GLOBE at Night

Family Observation Guide

Overview:

Determining Light Pollution of the Global Sky

Students and families are encouraged to participate in a global campaign to observe and record the magnitude of visible stars as a means of measuring light pollution in a given location. Public contributions to an online database will document the visible nighttime sky during March 22-29, 2006. The mapped results will be available online for participants to see the results of this global campaign. Students and families will learn how to locate the constellation Orion and that stars have different magnitudes of brightness in the night sky. This activity helps students and families understand how latitude and longitude coordinates provide a location system helping us to map and analyze the data submitted from all around the globe.

Materials Needed:

- Red light to use outside (A red light can be made by covering a flashlight with a brown paper bag or red cellophane and securing the covering with a rubber band to be sure it doesn't slip while making the observation. The light protects your night vision and should be no brighter than necessary to allow you to read the data sheet and observation guide in the dark.)
- Family Observation Guide, Magnitude Charts, and Observation Data Sheet
- Orion Finder Chart for your latitude
- Something to write on (clipboard or cardboard)
- Something to write with (pencil or pen)
- GPS unit, Maporama Web site (www.maporama.com) or topographic map (to determine the latitude and longitude coordinates of the observation location)

Safety:

Remember safety first!

- Please use your judgment as to whether your student should be supervised outside after dark in your location. **We encourage you to do this activity with your student.**
- Depending on your location, be sure your student is wearing suitable clothing for the weather and for being outside at night (light colored and/or with reflective colors).
- When choosing the darkest area in your location, make sure your student is not close to traffic, the edge of a balcony, or near danger in any other way.

Multiple Observations:

If you enjoyed this activity, your family may be interested in doing multiple submissions by selecting a new location to enter a report. The new location should be at least 1 km away from your original observation location. You may consider locations such as the home of a relative, a location near the edge of your community or near the center of your community. At each location, you will still want to determine the darkest area at which to safely make the observation. Don't forget to get new latitude and longitude coordinates for the new location to distinguish it from your initial location. Multiple observations may be conducted and reported on the same evening between 7:00-9:00 p.m. local time or on another evening between March 22 and 29, 2006.

Procedures:

1) This observation should be done between 7:00 pm and 9:00 p.m. (local time) during March 22-29, 2006. Note: At higher latitude locations, Orion will be low on the horizon, so you may need to do your observation closer to 7:00 p.m. rather than 9:00 p.m. because the constellation will set.

2) Determine the latitude and longitude coordinates of the observation location by using any of the following methods: (note: for help with this, visit the Lat/Long link in the Observe! section of www.globe.gov/globeatnight)

a. A GPS unit outside at the location site. This can be done prior to the observation or during day-

light if needed. Please report as many decimal places as the unit provides.
b. Visit www.maporama.com and enter your street address. Lat/Long coordinates for your location will be displayed in the lower left-hand corner of the web page.
c. A topographic map

3) Complete the information in the boxed section of the observation data sheet before going outside.

4) Go outside and check for cloud cover just prior to sunset to help determine if clouds will still be present after dark. Too many clouds may prohibit you from conducting the observation.

5) Determine the darkest area at your location by moving to where the most stars are visible in the sky toward the constellation Orion. If you have outside lights, be sure they are all off.

6) Use the appropriate Orion Finder Chart for your latitude to help you locate Orion in the sky. If clouds cover any part of the constellation Orion, do not record or report the observation. You can try the observation again on another night during March 22-29, 2006. If all of Orion is clearly visible, then continue.

7) Turn the red light on and fill in your local time on the Observation Data Sheet. Take care not to shine the light in anyone's eyes.

8) Review the Magnitude 1-7 Charts. Magnitude 7 Chart shows all the stars your eyes would see with no light pollution. Magnitude 1 Chart has next to no stars present and Magnitude 2 Chart shows only the stars your eyes would see with a lot of light pollution. As you move from Magnitude 1 Chart to Magnitude 7 Chart, the light pollution level decreases.

9) Turn the red light off and wait outside for at least 10 minutes for your eyes to adapt to the darkness. This is called becoming "dark-adapted."

10) When you are "dark-adapted":
a. Observe the constellation Orion and check again for any cloud cover.
b. Estimate the percentage of cloud cover present (clear, ¼ of the sky, ½ of the sky, greater than ½ of the sky). If clouds cover any part of the constellation Orion, stop now and wait until another night during the campaign to make your observation.
c. If all of Orion is clearly visible, compare what you are seeing to the Magnitude Charts and select the chart that most closely resembles what you are seeing.

11) Turn the red light on and record your observation. Select the Magnitude Chart that looks most like what you see in the sky. Also note and explain any other important information (i.e., stadium lights, large parking lot nearby, security lights nearby) in the comments section of the Observation Data Sheet.

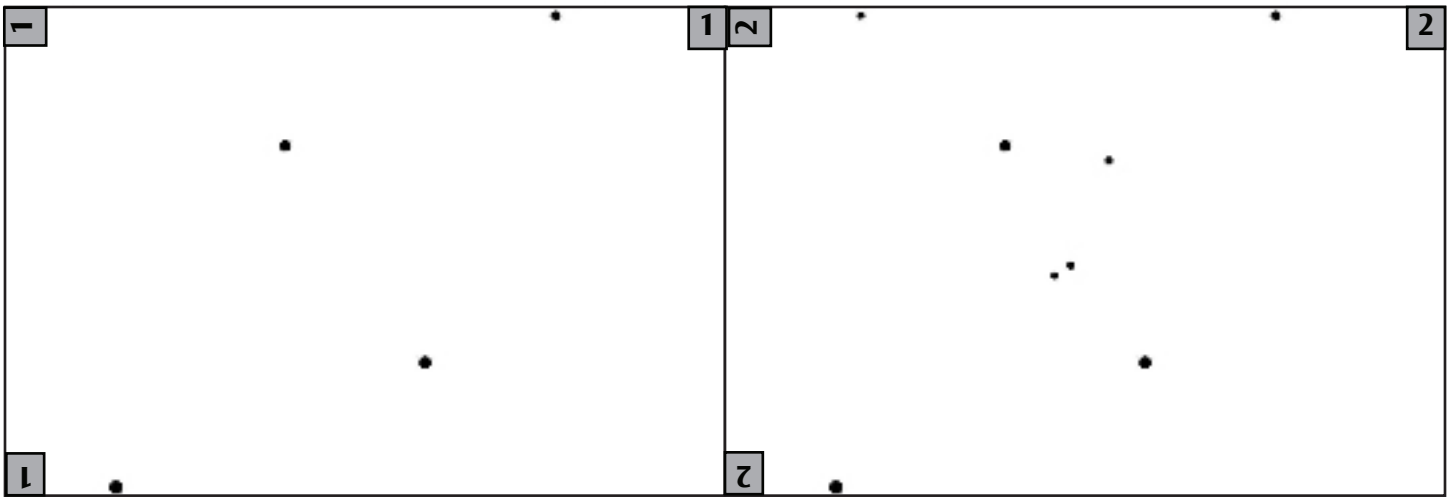
12) Go back inside and either report your observation online to the GLOBE at Night Web site (www.globe.gov/globeatnight) or return your Observation Data Sheet to your teacher/school to enter the observation online if this activity was suggested by the teacher. Your observation can be recorded anytime between March 22 -29, 2006.

Results:
As the campaign progresses, check the GLOBE at Night Web site (www.globe.gov/globeatnight) to see the mapped results. Running totals will be displayed as the observation data is submitted.

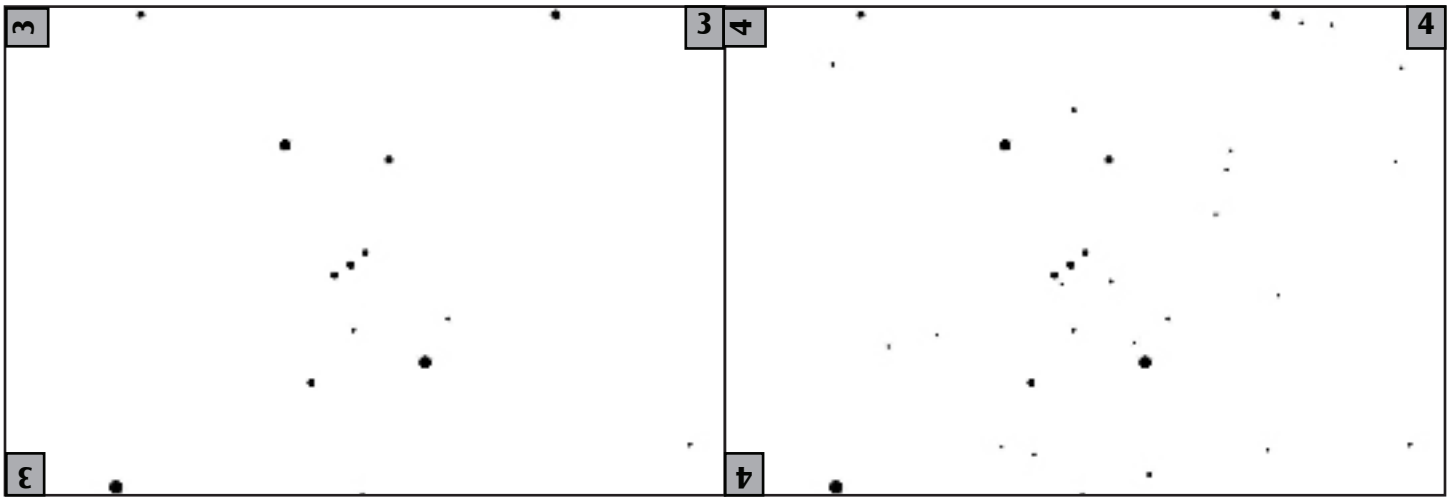
Magnitude Charts

The following charts were generated with celestial North straight up.
Please orient this page according to your location.

↑ Northern Hemisphere View ↑



Near Equator View ← ←

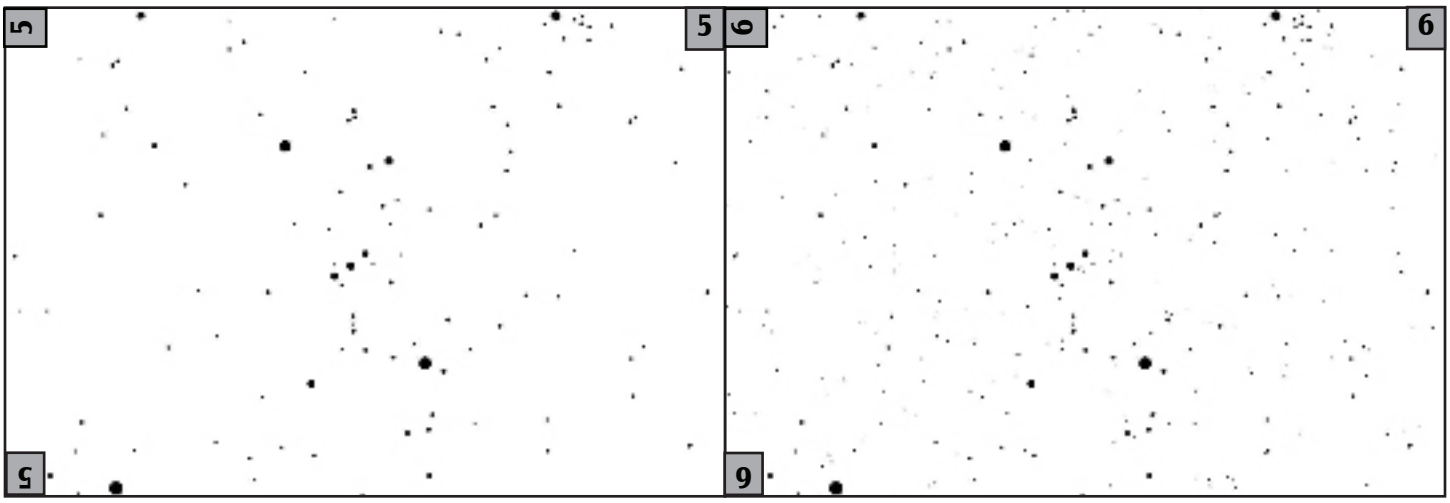


↙ Southern Hemisphere View ↙

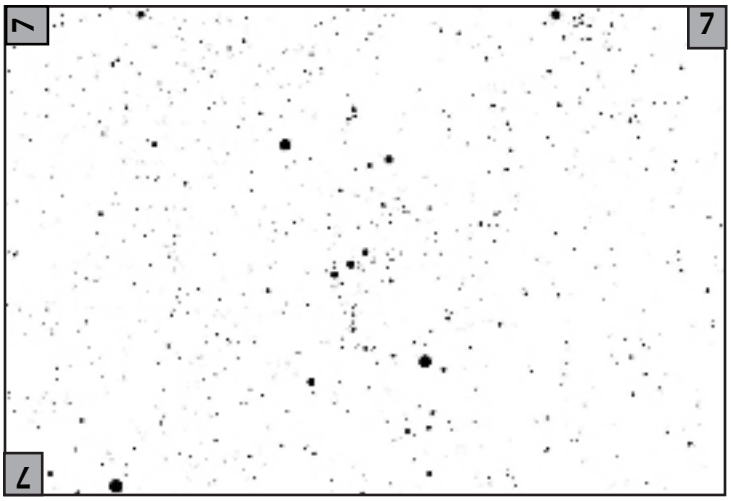
Magnitude Charts

The following charts were generated with celestial North straight up.
Please orient this page according to your location.

Northern Hemisphere View



Near Equator View



Southern Hemisphere View

GLOBE at Night

Observation Data Sheet

Only fields marked by * are required.

Fill Out Prior to Observation

*Date: March ____, 2006 Time Zone if known (e.g. CET):_____

*Latitude (in deg/min/sec or decimal degrees): _____ deg ____min_____sec _____ decimal degrees (North / South)

*Longitude (in deg/min/sec or decimal degrees): _____ deg ____min_____sec _____ decimal degrees (East / West)

Comments on location: (i.e. There is one street light within 50 m that is shielded from my view.)

Are there clouds covering any part of Orion? If yes, do not continue. If no, continue.

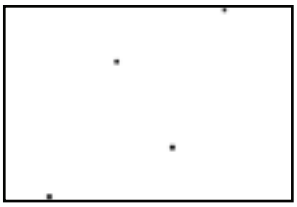
*Observation Time: ____:____ PM local time (HH:MM)

*Estimate the cloud cover in the sky:

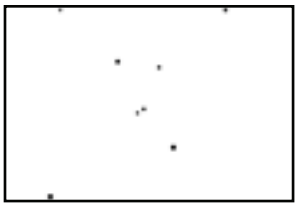
◯ Clear ◯ Clouds cover ¼ of sky ◯ Clouds cover ½ of sky ◯ Clouds cover > ½ of sky

Comments on sky conditions: (i.e. a little haze to the north)

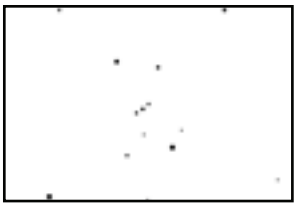
*Please record the visible stars you see by selecting the corresponding magnitude chart below:



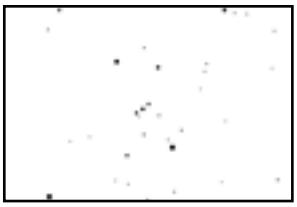
◯ Magnitude 1 Chart



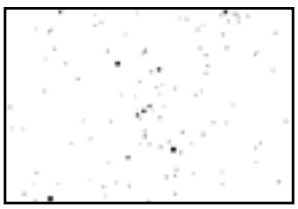
◯ Magnitude 2 Chart



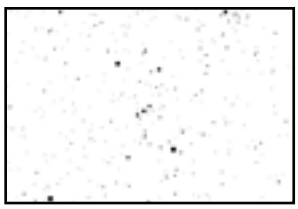
◯ Magnitude 3 Chart



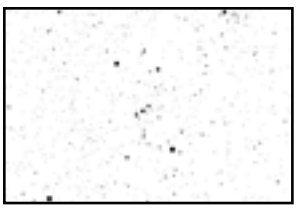
◯ Magnitude 4 Chart



◯ Magnitude 5 Chart



◯ Magnitude 6 Chart



◯ Magnitude 7 Chart

Additional comments: